

Steps 4 and 5: Assess the Questions and Act

See a Grab-a-Rule? Dive into it first. However, be very careful when checking the conditional rules. Your final clue list should look similar to the following one.

1. LP

2. ~~KS~~

3. $K_M \rightarrow G_T$
 $\sim G_T \rightarrow \sim K_M$

4. $S_W \rightarrow H_T$
 $\sim H_T \rightarrow \sim S_W$

Deduction GH

Step 6: Use Process of Elimination

1. Which one of the following could be a complete and accurate matching of dogs to the days on which they are placed?

- (A) Monday: greyhound, Labrador retriever
 Tuesday: husky, poodle
 Wednesday: keeshond, schnauzer
- (B) Monday: greyhound, keeshond
 Tuesday: Labrador retriever, poodle
 Wednesday: husky, schnauzer
- (C) Monday: keeshond, schnauzer
 Tuesday: greyhound, husky
 Wednesday: Labrador retriever, poodle
- (D) Monday: Labrador retriever, poodle
 Tuesday: greyhound, keeshond
 Wednesday: husky, schnauzer
- (E) Monday: Labrador retriever, poodle
 Tuesday: husky, keeshond
 Wednesday: greyhound, schnauzer

Here's How to Crack It

Start with the first clue. L and P must be together, so eliminate (A).

Move on to the second clue. G and H cannot be together, so eliminate (C).

Now, go on to clue 3. Remember, clue 3 applies only if the left side matches the answer choice. In (B), K is on Monday, but G is not on Tuesday. Eliminate (B). This rule does not apply to (D) and (E), so move on to clue 4.

Clue 4 says if S is on Wednesday, then H is on Tuesday. In (D), S is on Wednesday, but so is H. Eliminate (D).

Choice (E) is the only remaining choice. Lock it in and move on to the Specific questions.

Question 3 provides the most specific information so let's start with that one.

3. If the poodle is placed on Tuesday, then which one of the following could be true?

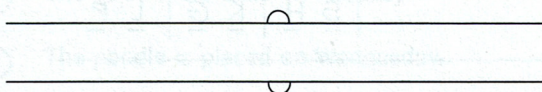
- (A) The greyhound is placed on Monday. 
- (B) The keeshond is placed on Monday. 
- (C) The Labrador retriever is placed on Monday. 
- (D) The husky is placed on Tuesday. 
- (E) The schnauzer is placed on Wednesday. 

Here's How to Crack It

First, begin by placing P and L on Tuesday. Next, check your other rules. Tuesday is completely full, so use the contrapositive of clue 3. G cannot be on Tuesday, so K cannot be on Monday. Therefore, place K on Wednesday. Clue 4 says if H is not on Tuesday, then S cannot be on Wednesday. Thus, S must be on Monday. We are left with G and H. The only rule that applies now is clue 2. However, we have only one space left in each available day. It doesn't matter which one is which, so indicate both possibilities on your diagram. Your final play should look like this.

GHKLPS	M	T	W
Clue Shelf KS	- -	- -	- -
③	S $\frac{G}{H}$	P L	K $\frac{G}{H}$

We are looking for what could be true. Choice (A) is supported by our diagram; G can, in fact, be on Monday. Lock this answer in and move on.



4. If the greyhound is placed on the same day as the keeshond, then which one of the following must be true?

- (A) The husky is placed on Monday.
- (B) The Labrador retriever is placed on Monday.
- (C) The keeshond is placed on Tuesday.
- (D) The poodle is not placed on Wednesday.
- (E) The schnauzer is not placed on Wednesday.

Here's How to Crack It

This question creates a block of GK but doesn't specify a location. As a result, get your pen moving and place the GK block on the diagram quickly. Start by placing GK on Monday and start applying the clues. Clue 3 says that if K is on Monday then G is on Tuesday. Our placement violated that rule. Draw a line through this play and try again.

GHKLPS	M	T	W
Clue Shelf KS	- -	- -	- -
③	S $\frac{G}{H}$	P L	K $\frac{G}{H}$
④	K G	- -	- -

Put GK on Tuesday. Clue 4 says that since H is not on Tuesday, S cannot be on Wednesday. Put S on Monday, which forces LP to Wednesday and H to Monday. Now, approach the answer choices. This question asks for which answer must be true, so you want to eliminate any answer that you have proven can be false with your play.

GHKLPS	M	T	W
Clue Shelf ☒ K5	- -	- -	- -
③	S ^G / _H	P _L	K ^G / _H
④	K _G	K _G	L _P

Choice (A) is true, so ignore it. Choice (B) does not have to be true, so eliminate it. Choice (C) is true, so ignore it. Choice (D) does not have to be true since P is on Wednesday, so eliminate it. Choice (E) is true, so ignore it. It's time to try another possibility. The only place we haven't tried is Wednesday. Put GK on Wednesday, LP on Monday, and SH on Tuesday.

GHKLPS	M	T	W
Clue Shelf ☒ K5	- -	- -	- -
③	S ^G / _H	P _L	K ^G / _H
④	K _G	K _G	L _P

Again, use POE to eliminate any answer that you have proven could be false. H is on Tuesday, so eliminate (A); K is on Wednesday, so eliminate (C). The only remaining answer is (E).

Let's move on to question 5.

5. If the husky is placed the day before the schnauzer, then which one of the following CANNOT be true?

- (A) The husky is placed on Monday. 
- (B) The keeshond is placed on Monday. 
- (C) The greyhound is placed on Tuesday. 
- (D) The poodle is placed on Tuesday. 
- (E) The poodle is placed on Wednesday. 

Here's How to Crack It

If this question (and the next) sounded more like an Ordering game question, you are correct! Even though this is primarily a Grouping game, there is a natural order to the days of the week, which allows the test-writers to slip in different question styles. The important thing here is to be flexible. The next thing you want to do *before* diagramming the new information is to reformulate the question stem. As discussed in this lesson, the words EXCEPT and NOT create the question stem's opposite. Change "CANNOT be true" to "must be false." Now, get that pen moving! K is before S, so let's just put K on Monday and S on Tuesday. This forces LP to be on Wednesday. Since K is on Monday, clue 3 applies, so put G on Tuesday and H in the final spot on Monday.

GHLPS	M	T	W
Clue Shelf 	--	--	--
(3)	S ^G / _H	P _L	K ^G / _H
(4)	K _G	---	---
	S _H	K _G	L _P
	L _P	S _H	K _G
(5)	K _H	S _G	L _P

We are looking for the answer that *must be false*, so eliminate any answer choice that your diagram proves could be true. Our play has proven that (A), (B), (C), and (E) can all be true. Since (D) is the only remaining answer, lock it in and move on to the final Specific question.

6. If the greyhound is placed the day before the poodle, then which one of the following CANNOT be placed on Tuesday?

- (A) the husky
(B) the keeshond
(C) the Labrador retriever
(D) the poodle
(E) the schnauzer

Here's How to Crack It

Start by figuring out the question stem. This one is a little more nuanced than the previous one, so it doesn't lend itself to a quick rewrite. Instead, focus on what you are looking for and what you will eliminate. We are looking for the single answer choice that can never be on Tuesday. Therefore, we want to eliminate any element that can be on Tuesday. As with the previous problem, do not waste precious test time thinking about all the different ways this can work. Pick up your pen and commit something to paper.

Begin by placing G on Monday and P on Tuesday. Now, apply the other rules. L must also be on Tuesday. K cannot be on Monday, so K goes on Wednesday. S must then be on Monday and H is on Wednesday.

GHKLPS	M	T	W
Clue Shelf ☒	--	--	--
③	S <u>G/H</u>	P <u>L</u>	K <u>G/H</u>
④	K <u>G</u>		
	S <u>H</u>	K <u>G</u>	L <u>P</u>
	L <u>P</u>	S <u>H</u>	K <u>G</u>
⑤	K <u>H</u>	S <u>G</u>	L <u>P</u>
⑥	G <u>S</u>	P <u>L</u>	K <u>H</u>

We have shown that both L and P can be placed on Tuesday, so eliminate (C) and (D). Next, try putting G on Tuesday and P on Wednesday. L must also be on Wednesday. H must be on Monday. Stop here for a moment and read the conditional clues very carefully! Neither clue 3 nor clue 4 applies since K is not on Monday and S is not on Wednesday. Therefore, K and S are interchangeable. Mark this on your diagram.

GHKLPS	M	T	W
Clue Shelf ☒ K S	- -	- -	- -
③	<u>S</u> ^G / _H	<u>P</u> <u>L</u>	<u>K</u> ^G / _H
④	<u>K</u> <u>G</u>	<u>L</u> <u>P</u>	<u>S</u> <u>H</u>
	<u>S</u> <u>H</u>	<u>K</u> <u>G</u>	<u>L</u> <u>P</u>
	<u>L</u> <u>P</u>	<u>S</u> <u>H</u>	<u>K</u> <u>G</u>
⑤	<u>K</u> <u>H</u>	<u>S</u> <u>G</u>	<u>L</u> <u>P</u>
⑥	<u>G</u> <u>S</u>	<u>P</u> <u>L</u>	<u>K</u> <u>H</u>
	<u>H</u> ^K / _S	<u>G</u> ^K / _S	<u>P</u> <u>L</u>

This play proves that both K and S can be on Tuesday when G is on the day before P. Eliminate (B) and (E). Since (A) is the only remaining answer choice, lock it in. The important take away from this question is *not* that your order or play exactly matches ours. The important thing is that you were aware of what you needed from the correct answer and what you were looking to eliminate. Also, it is important that you kept your pen moving, eliminating what you could, and repeating the process until you were down to a single answer choice.

Now, onward to the final question.

2. Which one of the following must be true?

- (A) The keeshond is not placed on the same day as the greyhound. 
- (B) The keeshond is not placed on the same day as the schnauzer. 
- (C) The schnauzer is not placed on the same day as the husky. 
- (D) The greyhound is placed on the same day as the schnauzer. 
- (E) The husky is placed on the same day as the keeshond. 

Here's How to Crack It

This question asks us which of the following must be true. From our deductions, we noted that K and S can never be together. Lock in (B).

On the actual exam, you would now move on to the next game. Before we do, however, we want to emphasize the POE approach discussed in the chapter. We went straight to deductions and happily, our question was answered. However, what would you do if you didn't have the KS antiblock deduction?

You would, of course, want to look at prior work. It is crucial to remember that prior work shows possibilities, not certainties. Therefore, for this question, prior work can be a POE tool. This is a Must Be True question, so any answer that shows a Could Be False possibility can be eliminated.

Choice (A) is disproven by our play from question 4 (incidentally, it is also disproven by the question stem of question 4). Choice (B) is not disproven by our diagram, so move on. Choice (C) is disproven by our first valid play from question 4, so it is gone. Choice (D) is disproven by our play for question 5. Choice (E) is also disproven by our play from question 5. Thus, even using this method, (B) is quickly shown to be the only remaining answer choice.

LESSON 4: IN-DEPTH CONDITIONALS AND IN/OUT GAMES

The games in Lessons 1 and 2 were Ordering games. Lesson 3 consisted of a Grouping game. These two kinds of tasks are very important and are often seen in LSAT games, but they aren't the only games tasks around. The task here is to pick some, but not all, of the elements. Those selected will be "In" the collection; those not selected will be "Out." As a result, we have ingeniously dubbed these "In/Out games." In fact, any game that hinges upon elements being grouped into one of two possibilities is an In/Out game. If items are selected/not selected, carried/not carried, chosen/not chosen, then you need to use an In/Out setup. It might be helpful to think of In/Out games as a very special two-column Grouping game.

In games with an In/Out task, it is just as important to keep track of the Out elements as it is to keep track of the ones that are In. Remember that we always want to have a place in our diagram to put all the elements in a game.

In Lesson 3, we saw one way in which conditionals can appear in Grouping games. Not surprisingly, they are vital to In/Out games. You could say that the majority of In/Out games are driven by conditional statements. Let's take a look again at an In/Out conditional clue.

If X is chosen, then Y is not chosen.

As indicated above, the central task on an In/Out game is to decide which elements are chosen and which are not. As we'll see in a moment, we diagram these by having two columns—one marked "In," and the other marked "Out"—to keep track of our elements. When we see clues like the previous one, we use a little shorthand, since they're so common. To show that an elements is In, we leave it alone. To show that it's Out, we negate it with a tilde ($\sim$) or a slash (/). Thus, the clue above would have a symbol that looks like this.

$$X \rightarrow \sim Y$$

Its associated contrapositive would be

$$Y \rightarrow \sim X$$

Just as with Grouping games in general, pay attention to what you can conclude and what you can't conclude from conditional clues.

Here's a summary of the process.

If we know...	...then we can conclude
X is In	Y is Out
Y is In	X is Out
X is Out	nothing
Y is Out	nothing

Possible arrangement that satisfy the rule include

IN	OUT
X	Y
Y	X
	XY*

The only arrangement precluded by the clue is

IN	OUT
XY	

The arrangement marked with the * above is usually the one that gives test-takers the most trouble; for this reason, expect to encounter it often. Note that we can conclude nothing from this rule if we know that X is Out; similarly, we can conclude nothing if Y is Out. Thus, the rule doesn't apply when X or Y is Out. Just like with Group games, a mechanical way to determine whether clues apply is to cover the right side of the arrow with your hand. If something from the diagram matches the left side of the arrow, then that rule applies. Otherwise, ignore the rule and move on to check the next one.

In the Arguments chapter, we discussed how conditionals can be viewed as either sufficient or necessary factors (see page 78 for a full discussion). Another way to conceptualize conditionals is dependent versus independent. Focus again on our example conditional.

$$X \rightarrow \sim Y$$

$$Y \rightarrow \sim X$$

Based on the discussion above, $\sim Y$ is independent. It can occur on its own without any knowledge of where X is located. The same is true of $\sim X$. This is why both Y and X can be Out. The right side of the arrow is the independent factor. The left side of the arrow, thus, is the dependent factor. It depends upon the requirement being followed. In other words, the moment that X is In, you can depend upon Y also being Out.

For In/Out games, the independent factor is the more important one. The LSAT test-writers enjoy crafting trap answers that hinge upon common misunderstandings of Independent factors. Consider the following conditional/contrapositive pair for the clue "if X is chosen, then so is Y."

$$X \rightarrow Y$$

$$\sim Y \rightarrow \sim X$$

At first glance, many students *wrongly* assume that this clue means that X and Y must always be together. This is not the case. Apply the discussion about Independent factors to this clue. The right side of the clue is independent. Therefore, the right side can occur without the left side happening. Thus, one valid permutation that satisfies this rule is

IN	OUT
Y	X

If you are having trouble following this logic, apply the mechanical approach to checking conditionals clues. Cover the right side of the arrows, and ask yourself if the rule applies. Based on this one clue, we have no knowledge of what occurs when Y is In or when X is Out.

Games Technique: If...Then and Its Relatives

We showed you in Lesson 3 how to diagram basic “if...then” statements. The “if” always occurs on the left side of the arrow, while the “then” statement is always to the right of the arrow. However, these are not the only ways the LSAT will structure conditional statements. There are two other major conditional phrases that you need to be on the lookout for.

The first of these is the word “only” (or “only when” or “only if”). The word “only” establishes a requirement. Thus, whatever condition follows the word “only” should be placed to the right side of the arrow.

X will be In only if Y is Out.

The diagram for this is as follows:

$X \rightarrow \sim Y$

If your head is spinning with all this logic, fret not, intrepid tester! There is a fast way to ensure that you diagram the conditional correctly every time. Simply find the word “only” and draw the conditional arrow directly on top of it.

X will be In only if Y is out.

As you can see, the statement practically diagrams itself. One final note: just as with “if...then” statements, the order of the sentence does not affect the diagram. The same statement could have been written as follows:

Only if Y is Out will X be in.

Use the same method by drawing the arrow over the “only if” phrase. Since the arrow points to $\sim Y$, that must be placed on the right side of the diagram.

Only if Y is Out will X be in.

Tip!

Since many trap answer are based upon misunderstandings about the independent factor, proactively play a game by putting the independent factors in the diagram first when the question allows. You will often be able to eliminate the trickiest answer choices right away.

This is how we negate the “or” statement. Not surprisingly, negating an “and” statement changes it into—you guessed it—an “or.” After all if we flip and negate the symbol we’ve drawn above, we should be back to our original symbol. In order to do that, we would turn the statement “not G and not H” into the statement “G or H.”

Remember that when you’re working with a statement involving “and” or “or,” you have to negate every part of the statement. When you negate “and,” it becomes “or”; when you negate “or,” it becomes “and.”

One last note of caution: be careful with the phrase “neither...nor.” Many students mistakenly think that “nor” is the same as “or” since they sound alike. In reality, “neither A nor B” means “not A and not B.” Consider the following phrase.

If neither Harry nor Sally is at the party, then John will not be at the party.

This phrase literally means if not Harry *and* not Sally, then not John. Therefore, it should be symbolized as

$$\begin{aligned}\sim H \text{ and } \sim S &\rightarrow \sim J \\ J &\rightarrow H \text{ or } S\end{aligned}$$

Do not make the mistake of thinking that because “or” and “nor” look alike, they must mean the same thing.

DIAGRAMMING CONDITIONALS DRILL

In order to practice diagramming conditionals, we've created a little quiz for you to practice these crucial skills and concepts. Make sure you translate each one carefully and generate the contrapositives before you move on.

1. If Jack attends, Mark must attend.
2. Ann will work only if Kate works.
3. Bob cannot work unless Gary is working.
4. Sid will attend the party only if Nancy attends.
5. If Will goes to the party, Cam won't go.
6. If Harry is invited, both Charles and Linda must be invited.
7. John will not speak unless neither Bill nor Harry speaks.
8. Doug will drive unless either May or Sue drives.

Cracking the Diagramming Conditionals Drill

We have placed each of these in table form, so that you have a quick reference guide for your notes as you study.

Clue	Symbol	Contrapositive
If Jack attends, Mark must attend.	$J \rightarrow M$	$\sim M \rightarrow \sim J$
Ann will work only if Kate works.	$A \rightarrow K$	$\sim K \rightarrow \sim A$
Bob cannot work unless (if not) Gary is working.	$\sim G \rightarrow \sim B$	$B \rightarrow G$
Sid will attend the party only if Nancy attends.	$S \rightarrow N$	$\sim N \rightarrow \sim S$
If Will goes to the party, Cam won't go.	$W \rightarrow \sim C$	$C \rightarrow \sim W$
If Harry is invited, both Charles and Linda must be invited.	$H \rightarrow C \text{ and } L$	$\sim C \text{ or } \sim L \rightarrow \sim H$
John will not speak unless (if not) neither Bill nor Harry speaks.	$B \text{ or } H \rightarrow \sim J$	$J \rightarrow \sim B \text{ and } \sim H^*$
Doug will drive unless (if not) either May or Sue drives.	$\sim M \text{ and } \sim S \rightarrow D$	$\sim D \rightarrow M \text{ or } S^*$

The two marked with an * deserve additional explanation. "Unless" statements with "and" or "or" can be incredibly challenging to diagram. Remember that when you negate, you have to negate the entire side. A more expanded diagram of John, Bill, and Harry is below.

$$\sim(\sim B \text{ and } \sim H) \rightarrow \sim J$$

The double negatives become positives and the "and" becomes an "or." Thus, the final diagram of

$$B \text{ or } H \rightarrow \sim J$$

The last one is even trickier, but follows the same process by expanding out the diagram even more.

$$\sim(M \text{ or } S) \rightarrow D$$

The negative applies to both M and S and the "or" becomes an "and." Thus, the final diagram of

$$\sim M \text{ and } \sim S \rightarrow D$$

Games Technique: Placeholder Deductions

While In/Out games often have tons of conditionals, as we have already discussed, creating conditional chains can be time-consuming, tedious, and distracting. Often, it is best to stick with the original conditionals and leave your clue list relatively uncluttered. You should, however, make some deductions that are rather sophisticated but are useful on In/Out games. These are called *placeholder deductions*.

Consider the original example in this section. If X is selected, Y is not selected. We summarized this clue by noting that one of them could be In, or they could both be Out. The only situation that could not occur is both X and Y being In at the same time (see the table on page 213 if you need to refresh your memory). In essence, this conditional statement creates an antiblock in the In column. At any given time, one of the two elements, X or Y, must be Out. This means that the Out column will always have at least one element in it. This deduction can be symbolized as follows.

XY In	Out
	$\underline{X/Y}$

Note that on this diagram we have provided both the antiblock and the placeholder deduction. On an actual game, you need to focus on getting only the placeholder deduction. Let's consider another example.

If A is not selected, then B is.

Start by symbolizing this clue and finding the contrapositive.

$$\sim A \rightarrow B$$

$$\sim B \rightarrow A$$

Now, take some time to consider the different possibilities here. Remember that the right side of the arrow is independent. Both B and A can be selected individually. However, if A is Out, then B must be In, and vice versa. What is the only possibility that cannot occur? Hopefully, you said that they cannot both be Out. Again, we have an antiblock created, this time in the Out column. As a result, there will be a placeholder in the In column.

In	Out AB
$\underline{A/B}$	

As with the earlier section on “unless” and “only” statements, there is a shortcut that can be taken. On a side note, isn’t it curious that some of the most confusing logic clues on the Games section all have shortcuts? Let’s look at our original conditional statement and deduction.

$$X \rightarrow \sim Y$$

$$Y \rightarrow \sim X$$

In	Out
XY	$\frac{X}{Y}$

Take a look at the right side of the arrows in the conditional/contrapositive pair. Do you see how both elements share the same sign (both are Out)? This is what is called *paired independent factors*. When you have paired independent factors from a single conditional statement, you can immediately make the placeholder in the column indicated by the sign. Here, the paired factors are Out, so put the placeholder in the Out column, and then simply fill in the either/or situation with the elements from the clue: here, X or Y.

The same shortcut applies to the second example.

$$\sim A \rightarrow B$$

$$\sim B \rightarrow A$$

A and B on the right side of the arrows form paired independent factors. They are In, so the placeholder goes In and is filled with A/B.

Understanding both the logic and mechanics of paired independent factors is important for finding all the placeholder deductions without creating false deductions. For example, consider the following situation. Before reading the explanation, take a few minutes to determine why a placeholder deduction cannot be made.

$$A \rightarrow B$$

$$\sim B \rightarrow \sim A$$

The short answer to the question above is that the independent factors are not paired, but why is this crucial? As we have told you repeatedly, the right side can occur independently of the left. The table below shows you the different valid permutations.

IN	OUT
AB	
AB	
B	A

As you can see, we cannot determine from this single clue whether one of the two elements is always forced into either the In or Out column.

There can also be variations in placeholder deductions. Placeholders, for example, can deal with more than two clues. The same principles apply, nonetheless. Here's an example.

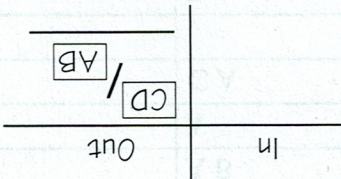
If A or B is selected, then C and D are not.

First, diagram the conditional and the contrapositive.

$A \text{ or } B \rightarrow \sim C \text{ and } \sim D$

$C \text{ or } D \rightarrow \sim A \text{ and } \sim B$

Note the paired independent factors. Each possibility includes an "and" situation, but this is not as frightening as it initially appears. Either a CD block or an AB block will always be Out. This means that you have already determined that there is a minimum of two elements Out every time. The placeholder deduction would appear as follows:



Another, more challenging, variant could be like this.

If neither A nor B is selected, then C or D is.

The diagram would appear as follows:

$\sim A \text{ and } \sim B \rightarrow C \text{ or } D$

$\sim C \text{ and } \sim D \rightarrow A \text{ or } B$

We still see the paired independent factors, but this time they include an “or” situation. This is more complicated. Basically, either C or D -OR- A or B will always be in. This is highly unspecific, and arguably the usefulness of the deduction is limited. However, we would still be able to note that in any play of the game, there is at least one element always In. This is useful since many In/Out games ask about the minimum or maximum numbers of elements that can be in one of the columns. The deduction would look like the following:

In	Out
$A/B/C/D$	

Paired independent factors do not have to perfectly align with all elements in the clue in order for a placeholder deduction to be made. Look at the following item.

If A is selected, then B is also but C is not.

$$A \rightarrow B \text{ and } \sim C$$

$$\sim B \text{ or } C \rightarrow \sim A$$

This one is daunting. However, paired independent factors would suggest that either A or C is always Out. Should we actually put a placeholder there? Let's look at a table to be sure.

IN	OUT
A B	C
	B C A
C	A B
C B	A
B	C A
A B C	
A C	B
A	B C

This is a complex clue, so there are multiple possible permutations that do not violate the rule. Every single valid permutation has either A or C, or both, Out. Therefore, we can safely make a placeholder for A/C in the Out column.

In	Out
	A/C

Do not worry about breaking apart a whole clue to make the deduction. You will still have the original clue symbolized in your clue list and you should be referencing it every time you play the game. The deduction helps us narrow the number of possible elements that can be located in either column.

On the next page is a drill for finding placeholder deductions. Assume that all clues pertain to In/Out games. Not every question will have a valid deduction. If that is the case, write “none” on the diagram.

If C is in, then D is in.	→		
E and F cannot both be in.	⊥		
G or H is chosen only if I is not.	→		
If J is in, then K is in.	→		
L or M is in, then N is in.	→		
O is in, then P is in.	→		
Q is in, then R is in.	→		
S is in, then T is in.	→		
U is in, then V is in.	→		
W and X are always in the same column.	→		
Y is in, then Z is in.	→		

Now that you have been introduced to detailed conditional clues, placeholder deductions, and their relationship to In/Out games, it's time to try your hand at one.

PLACEHOLDER DEDUCTION DRILL

1. If A is out, then B is in.

In	Out

2. If C is today, then D is tomorrow.

In	Out

3. E and F cannot both be chosen.

In	Out

4. G or H is chosen only if J is not.

In	Out

5. If K or L, then M and N.

In	Out

6. If O is Out, then so is P.

In	Out

7. Unless Quinn is chosen, Rachel will be chosen.

In	Out

8. S and T will occur only when U or V doesn't.

In	Out

9. Will and Xavier always speak on different days.

In	Out

10. If Y, then not Z.

In	Out

Cracking the Placeholder Deduction Drill

Each question has been placed in a table to help you study.

Statement	Diagram	Deduction						
If A is out, then B is in.	$\sim A \rightarrow B$ $\sim B \rightarrow A$	<table><tr><td>In</td><td>Out</td></tr><tr><td>$\frac{A/B}{-}$</td><td></td></tr></table>	In	Out	$\frac{A/B}{-}$			
In	Out							
$\frac{A/B}{-}$								
If C is today, then D is tomorrow.	$C \rightarrow \sim D$ $D \rightarrow \sim C$	<table><tr><td>In</td><td>Out</td></tr><tr><td></td><td>$\frac{C/D}{-}$</td></tr></table>	In	Out		$\frac{C/D}{-}$		
In	Out							
	$\frac{C/D}{-}$							
E and F cannot both be chosen.	<table><tr><td>$\boxed{EF}$ In</td><td>Out</td></tr></table>	$\boxed{EF}$ In	Out	<table><tr><td>$\boxed{EF}$ In</td><td>Out</td></tr><tr><td></td><td>$\frac{E/F}{-}$</td></tr></table>	$\boxed{EF}$ In	Out		$\frac{E/F}{-}$
$\boxed{EF}$ In	Out							
$\boxed{EF}$ In	Out							
	$\frac{E/F}{-}$							
G or H is chosen only if J is not.	$G \text{ or } H \rightarrow \sim J$ $J \rightarrow \sim G \text{ and } \sim H$	<table><tr><td>In</td><td>Out</td></tr><tr><td></td><td>$\frac{J/\boxed{GH}}{-}$</td></tr></table>	In	Out		$\frac{J/\boxed{GH}}{-}$		
In	Out							
	$\frac{J/\boxed{GH}}{-}$							
If K or L, then M and N.	$K \text{ or } L \rightarrow M \text{ and } N$ $\sim M \text{ or } \sim N \rightarrow \sim K \text{ and } \sim L$	none						
If O is out, then so is P.	$\sim O \rightarrow \sim P$ $P \rightarrow O$	none						
Unless (if not) Q is chosen, R will be chosen.	$\sim Q \rightarrow R$ $\sim R \rightarrow Q$	<table><tr><td>In</td><td>Out</td></tr><tr><td>$\frac{Q/R}{-}$</td><td></td></tr></table>	In	Out	$\frac{Q/R}{-}$			
In	Out							
$\frac{Q/R}{-}$								
S and T will occur only when U or V doesn't.	$S \text{ and } T \rightarrow \sim U \text{ or } \sim V$ $U \text{ and } V \rightarrow \sim S \text{ or } \sim T$	<table><tr><td>In</td><td>Out</td></tr><tr><td></td><td>$\frac{U/V/\sim S/\sim T}{-}$</td></tr></table>	In	Out		$\frac{U/V/\sim S/\sim T}{-}$		
In	Out							
	$\frac{U/V/\sim S/\sim T}{-}$							
Will and Xavier always speak on different days.	$\boxed{WX}$	<table><tr><td>$\boxed{WX}$ In</td><td>Out $\boxed{WX}$</td></tr><tr><td>$\frac{W/X}{-}$</td><td>$\frac{W/X}{-}$</td></tr></table>	$\boxed{WX}$ In	Out $\boxed{WX}$	$\frac{W/X}{-}$	$\frac{W/X}{-}$		
$\boxed{WX}$ In	Out $\boxed{WX}$							
$\frac{W/X}{-}$	$\frac{W/X}{-}$							
If Y then not Z.	$Y \rightarrow \sim Z$ $Z \rightarrow \sim Y$	<table><tr><td>In</td><td>Out</td></tr><tr><td></td><td>$\frac{Y/Z}{-}$</td></tr></table>	In	Out		$\frac{Y/Z}{-}$		
In	Out							
	$\frac{Y/Z}{-}$							

Now that you have been introduced to detailed conditional clues, placeholder deductions, and their relationship to In/Out games, it is time to try your hand at one.

GAME 4

Game 4 and its questions are from PrepTest 36, Section 4, Questions 1–6.

A fruit stand carries at least one kind of the following kinds of fruit: figs, kiwis, oranges, pears, tangerines, and watermelons. The stand does not carry any other kind of fruit. The selection of fruits the stand carries is consistent with the following conditions:

If the stand carries kiwis, then it does not carry pears.

If the stand does not carry tangerines, then it carries kiwis.

If the stand carries oranges, then it carries both pears and watermelons.

If the stand carries watermelons, then it carries figs or tangerines or both.

1. Which one of the following could be a complete and accurate list of the kinds of fruit the stand carries?

- (A) oranges, pears
- (B) pears, tangerines
- (C) oranges, pears, watermelons
- (D) oranges, tangerines, watermelons
- (E) kiwis, oranges, pears, watermelons

2. Which one of the following could be the only kind of fruit the stand carries?

- (A) figs
- (B) oranges
- (C) pears
- (D) tangerines
- (E) watermelons

3. Which one of the following CANNOT be a complete and accurate list of the kinds of fruit the stand carries?

- (A) kiwis, tangerines
- (B) tangerines, watermelons
- (C) figs, kiwis, watermelons
- (D) oranges, pears, tangerines, watermelons
- (E) figs, kiwis, oranges, pears, watermelons

4. If the stand carries no watermelons, then which one of the following must be true?

- (A) The stand carries kiwis.
- (B) The stand carries at least two kinds of fruit.
- (C) The stand carries at most three kinds of fruit.
- (D) The stand carries neither oranges nor pears.
- (E) The stand carries neither oranges nor kiwis.

5. If the stand carries watermelons, then which one of the following must be false?

- (A) The stand does not carry figs. 
- (B) The stand does not carry tangerines. 
- (C) The stand does not carry pears. 
- (D) The stand carries pears but not oranges. 
- (E) The stand carries pears but not tangerines. 

6. If the condition that if the fruit stand does not carry tangerines then it does carry kiwis is suspended, and all other conditions remain in effect, then which one of the following CANNOT be a complete and accurate list of the kinds of fruit the stand carries?

- (A) pears 
- (B) figs, pears 
- (C) oranges, pears, watermelons 
- (D) figs, pears, watermelons 
- (E) figs, oranges, pears, watermelons 

Step 2: Symbolize the Clues and Double-check

All of the clues are conditional statements. Remember that if you have a conditional clue, you also should create the reverse statement. Symbolizing the clues gives you a more organized way to work with the clues. Here are the clues symbolized:

- 1. If the stand carries watermelons, then it carries pears.
- 2. If the stand carries pears, then it carries oranges.
- 3. If the stand carries oranges, then it carries figs.
- 4. If the stand carries figs, then it carries tangerines.
- 5. If the stand carries tangerines, then it carries kiwis.
- 6. If the stand does not carry tangerines, then it carries kiwis.

It's crucial to double-check carefully when you're symbolizing conditional clues and check your conditional clues closely as well. If you're ever unsure of a clue, which is always a good idea, go back to the original clue and check it out. If you're unsure, go back and review the clues on symbolizing conditional clues.

Self-Assessment

Steps 1–3 Assessment

Steps 4–6 Assessment

Cracking Game 4

Step 1: Diagram and Inventory

This is a fairly standard 1D In/Out game. The fruit stand will either carry a fruit, or it won't. The elements are the six different types of fruit, which all fall into a single category. Set up a two-column diagram in which Carries is In and Not Carries is Out. If you need to, go ahead and put both labels on your columns.

Carries (In)	Out

As you can see, the diagram is fairly straightforward. The only thing that we don't know is how many of each type of fruit must be In or Out. Therefore, we will have to rely on making placeholder deductions.

Step 2: Symbolize the Clues and Double-check

All of the clues are conditional statements. Remember that every time you have a conditional clue, you also should deduce the contrapositive. Symbolize the contrapositive as soon as you've symbolized the clue. Here are the four clues.

1. $\begin{cases} K \rightarrow \sim P \\ P \rightarrow \sim K \end{cases}$
2. $\begin{cases} \sim T \rightarrow K \\ \sim K \rightarrow T \end{cases}$
3. $\begin{cases} O \rightarrow P \text{ and } W \\ \sim P \text{ or } \sim W \rightarrow \sim O \end{cases}$
4. $\begin{cases} W \rightarrow F \text{ or } T \\ \sim F \text{ and } \sim T \rightarrow \sim W \end{cases}$

It's crucial to double-check carefully when you're symbolizing conditional clues, and check your contrapositives closely as well. Forgetting even one negation or an and/or switch can cause a great deal of mischief. If your symbols don't match the ones above, be sure to go back and review the lesson on symbolizing conditional clues.